Request for Section 18 emergency use of Sulfoxaflor (Transform® WG Insecticide) to control sugarcane aphid (*Melanaphis* sp.) in sorghum fields (grain and forage) in the state of Mississippi.

Type of Exemption - Mississippi Section 18; Specific Exemption Request; December 22, 2014

This is an application for a specific exemption to authorize the use of Sulfoxaflor (Transform® WG Insecticide EPA Reg. No. 62719-625) to control the newly introduced sugarcane aphid (SA), *Melanaphis sp.* in sorghum. The following information is submitted in the format indicated in the proposed rules for Chapter 1, Title 40 CFR, Part 166.

SECTION 166.20(a)(1): IDENTITY OF CONTACT PERSONS

i. The following are the contact persons responsible for the administration of the emergency exemption:

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Bureau of Plant Industry
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Mississippi State, MS 39762
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Mississippi Department of Agriculture & Commerce
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ii. The following qualified experts are also available to answer questions:

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Mississippi Cooperative Extension Service
Mississippi State University
Mississippi State, MS 39762

SECTION 166.20(a)(2): DESCRIPTION OF THE PESTICIDE REQUESTED

i. **Common Chemical Name (Active Ingredient**): Sulfoxaflor

Brand/Trade Name and EPA Reg. No.: Transform® WG Insecticide,
EPA Reg. No. 62719-625

Formulation: Active Ingredient 50%

SECTION 166.20(a)(3): DESCRIPTION OF THE PROPOSED USE

i. Sites to be treated:
Sorghum fields (grain and forage) with the newly introduced sugarcane aphid (SA), *Melanaphis sp.* statewide.

ii. Method of Application:
Applications will be made by foliar application.

iii. Rate of Application:
0.75 – 1.5 oz. of Transform® WG/acre (0.023 – 0.047 lb ai/acre).

iv. Maximum Number of Applications:
3 applications per growing season using a rate of 0.75-1.5 oz/ac (0.023–0.047 lb ai/acre) with a maximum of 3 oz/acre per growing season (0.094 lb ai/acre).

v. Total Acreage to be Treated:
According to the National Agricultural Statistics Service (NASS), 115,000 acres of sorghum was planted in Mississippi in 2014.

vi. Total Amount of Pesticide to be used:
Based on the amount of acreage in Mississippi, if all 115,000 acres of sorghum were treated with the proposed maximum allowable use rate in a single growing season (3.0 oz./acre total) then 2,695.313 gallons of Transform® would be used in 2015.

vii. Restrictions and Requirements:
Refer to the Transform® WG container label for first aid, precautionary statements, directions for use and conditions of sale and warranty information. It is a violation of federal law to use this product in a manner that is inconsistent with all applicable label directions, restrictions and precautions found in the container label and this supplemental label. Both the container label and this supplemental section 18 quarantine exemption label must be in the possession of the user at the time of application.

- Applicable restrictions and requirements concerning the proposed use and the qualifications of applicators using Transform® WG are as follows:
  - Pre-harvest Interval: Do not apply within 7 days of harvest for grain or 14 days of harvest for forage or stover.
  - Minimum Treatment Interval: Do not make applications less than 14 days apart.
  - Do not make more than three applications per acre per year.
  - Do not apply more than a total of 3.0 oz of Transform WG (0.09 lb ai of sulfoxaflor) per acre per year.

viii. Duration of the Proposed Use:
May 1, 2015 – October 31, 2015

ix. Earliest Possible Harvest Date:
Early August in Mississippi, typically.

SECTION 166.20(a)(4): ALTERNATIVE METHODS OF CONTROL

The Texas request indicated several pesticides that do not provide adequate control of sugarcane aphids from 2013 field trials. Additionally the Texas request indicated several products that are available as in-furrow applications and seed treatments; however, none of these products have proved to be effective for season long control of sugar cane aphids. Other products that have some sugarcane aphid control in sorghum have a lengthy pre-harvest interval, making it difficult to control a late season infestation.

Sorghum breeders are currently working on resistant lines and cultural practices are evaluated, such as planting date and plan populations.

SECTION 166.20(a)(5): EFFICACY OF USE PROPOSED UNDER SECTION 18

Dr. Angus Catchot of Mississippi State University preformed field trials to measure the efficacy of products to control sugarcane aphids infestations in sorghum. These field trials indicated that sulfoxaflor, Transform® WG, at 1 oz/acre provided great control of sugarcane aphids with minimal aphid counts, whereas other products provided less control of sugarcane aphid.

The following document provides data to support the efficacy of sulfoxaflor of control of *Melanaphis sacchari* in sorghum:

- Sugarcane Aphid Mississippi – Insecticide Evaluation (Attachment A)

SECTION 166.20(a)(6): EXPECTED RESIDUES FOR FOOD USES

Acute Assessment

Food consumption information from the USDA 1994-1996 and 1998 Nationwide Continuing Surveys of Food Intake by Individuals (CSFII) and maximum residues from field trials rather than tolerance-level residue estimates were used. It was assumed that 100% of crops covered by the registration request are treated and maximum residue levels from field trials were used.

Drinking water. Two scenarios were modeled, use of sulfoxaflor on non-aquatic row and orchard crops and use of sulfoxaflor on watercress. For the non-aquatic crop scenario, based on the Pesticide Root Zone Model/Exposure Analysis Modeling System (PRZM/EXAMS) and Screening Concentration in Ground Water (SCI-GROW) models, the estimated drinking water concentrations (EDWCs) of sulfoxaflor for acute exposures are 26.4 ppb for surface water and 69.2 ppb for ground water. For chronic exposures, EDWCs are 13.5 ppb for surface water and 69.2 ppb for ground water. For chronic exposures for cancer assessments, EDWCs are 9.3 ppb for surface water and 69.2 ppb for ground water. For the watercress scenario, the EDWCs for surface water are 91.3 ppb after one application, 182.5 ppb after two applications and 273.8 ppb after three applications.

Dietary risk estimates using both sets of EDWCs are below levels of concern. The non-aquatic-crop EDWCs are more representative of the expected exposure profile for the majority of the population. Also, water concentration values are adjusted to take into account the source of the water; the relative amounts of parent sulfoxaflor, X11719474, and X11519540; and the relative liver toxicity of the metabolites as compared to the parent compound.

For acute dietary risk assessment of the general population, the groundwater EDWC is greater than the surface water EDWC and was used in the assessment. The residue profile in groundwater is 60.9 ppb X11719474 and 8.3 ppb X11519540 (totaling 69.2 ppb). Parent sulfoxaflor does not occur in groundwater. The regulatory toxicological endpoint is based on neurotoxicity.

For acute dietary risk assessment of females 13-49, the regulatory endpoint is attributable only to the parent compound; therefore, the surface water EDWC of 9.4 ppb was used for this assessment.

A tolerance of 0.3 ppm for sulfoxaflor on grain sorghum has been established. There is no expectation of residues of sulfoxaflor and its metabolites in animal commodities as a result of the proposed use on sorghum. Thus, animal feeding studies are not needed, and tolerances need not be established for meat, milk, poultry, and eggs.

Drinking water exposures are the driver in the dietary assessment accounting for 100% of the exposures. Exposures through food (sorghum grain and syrup) are zero.

The acute dietary exposure from food and water to sulfoxaflor is 16% of the aPAD for children 1-2 years old and females 13-49 years old, the population groups receiving the greatest exposure.

Chronic Assessment

The same refinements as those used for the acute exposure assessment were used, with two exceptions: (1) average residue levels from crop field trials were used rather than maximum values and (2) average residues from feeding studies, rather than maximum values, were used to derive residue estimates for livestock commodities. It was assumed that 100% of crops are treated and average residue levels from field trials were used.

For chronic dietary risk assessment, the toxicological endpoint is liver effects, for which it is possible to account for the relative toxicities of X11719474 and X11519540 as compared to sulfoxaflor. The groundwater EDWC is greater than the surface water EDWC. The residue profile in groundwater is 60.9 ppb X11719474 and 8.3 ppb X11519540. Adjusting for the relative toxicity results in 18.3 ppb equivalents of X11719474 and 83 ppb X11519540 (totaling 101.3 ppb). The adjusted groundwater EDWC is greater than the surface water EDWC (9.3 ppb) and was used to assess the chronic dietary exposure scenario.

The maximum dietary residue intake via consumption of sorghum commodities would be only a small portion of the RfD (<0.001%) and therefore, should not cause any additional risk to humans via chronic dietary exposure. Consumption of sorghum by sensitive sub-populations such as children and non-nursing infants is essentially zero. Thus, the risk of these subpopulations to chronic dietary exposure to sulfoxaflor used on grain sorghum would be insignificant.

The major contributor to the risk was water (100%). There was no contribution from grain sorghum to the dietary exposure. All other populations under the chronic assessment show risk estimates that are below levels of concern.

Chronic exposure to sulfoxaflor from food and water is 18% of the cPAD for infants, the population group receiving the greatest exposure. There are no residential uses for sulfoxaflor.

Short-term risk. Because there is no short-term residential exposure and chronic dietary exposure has already been assessed, no further assessment of short-term risk is necessary, the chronic dietary risk assessment for evaluating short-term risk for sulfoxaflor is sufficient.

Intermediate-term risk. Intermediate-term risk is assessed based on intermediate-term residential exposure plus chronic dietary exposure. Because there is no residential exposure and chronic dietary exposure has already been assessed, no further assessment of intermediate-term risk is necessary.

Cumulative effects. Sulfoxaflor does not share a common mechanism of toxicity with any other substances, and does not produce a toxic metabolite produced by other substances. Thus, sulfoxaflor does not have a common mechanism of toxicity with other substances.

Cancer. A nonlinear RfD approach is appropriate for assessing cancer risk to sulfoxaflor. This approach will account for all chronic toxicity, including carcinogenicity that could result from exposure to sulfoxaflor. Chronic dietary risk estimates are below levels of concern; therefore, cancer risk is also below levels of concern.

There is a reasonable certainty that no harm will result to the general population, or to infants and children from aggregate exposure to sulfoxaflor as used in this emergency exemption request.

The content in the above Section 166.20(a)(6): "Expected Residues For Food Uses" was prepared by Michael Hare, Ph.D., Texas Department of Agriculture.

SECTION 166.20(a)(7): DISCUSSION OF RISK INFORMATION

Human Health Effects – Michael Hare, Ph.D.
Ecological Effects – David Villarreal, Ph.D.
Environmental Fate – David Villarreal, Ph.D.

Human Health

Toxicological Profile

Sulfoxaflor is a member of a new class of insecticides, the sulfoximines. It is an activator of the nicotinic acetylcholine receptor (nAChR) in insects and, to a lesser degree, mammals. The nervous system and liver are the target organs, resulting in developmental toxicity and hepatotoxicity.

Developmental toxicity was observed in rats only. Sulfoxaflor produced skeletal abnormalities likely resulting from skeletal muscle contraction due to activation of the skeletal muscle nAChR in utero. Contraction of the diaphragm, also related to skeletal muscle nAChR activation, prevented normal breathing in neonates and increased mortality. The skeletal abnormalities occurred at high doses while decreased neonatal survival occurred at slightly lower levels.

Sulfoxaflor and its major metabolites produced liver weight and enzyme changes, and tumors in subchronic, chronic and short-term studies. Hepatotoxicity occurred at lower doses in long-term studies compared to short-term studies.

Reproductive effects included an increase in Leydig cell tumors which were not treatment related due to the lack of dose response, the lack of statistical significance for the combined tumors, and the high background rates for this tumor type in F344 rats. The primary effects on male reproductive organs are secondary to the loss of normal testicular function due to the size of the Leydig Cell adenomas. The secondary effects to the male reproductive organs are also not treatment related. It appears that rats are uniquely sensitive to these developmental effects and are unlikely to be relevant to humans.

Clinical indications of neurotoxicity were observed at the highest dose tested in the acute neurotoxicity study in rats. Decreased motor activity was also observed in the mid- and high-dose groups. Since the neurotoxicity was observed only at a very high dose and many of the effects are not consistent with the perturbation of the nicotinic receptor system, it is unlikely that these effects are due to activation of the nAChR.

Tumors have been observed in rat and mouse studies. In rats, there were significant increases in hepatocellular adenomas in the high-dose males. In mice, there were significant increases in hepatocellular adenomas and carcinomas in high dose males. In female mice, there was an increase in carcinomas at the high dose. Liver tumors in mice were treatment-related. Leydig cell tumors were also observed in the high-dose group of male rats, but were not related to treatment. There was also a significant increase in preputial gland tumors in male rats in the high-dose group. Given that the liver tumors are produced by a non-linear mechanism, the Leydig cell tumors were not treatment-related, and the preputial gland tumors only occurred at the high dose in one sex of one species, the evidence of carcinogenicity was weak.

<u>Ecological Toxicity</u>

Sulfoxaflor (N-[methyloxido[1-[6-(trifluoromethyl)-3-pyridinyl]ethyl]-lambda 4-sulfanylidene]) is a new variety of insecticide as a member of the sulfoxamine subclass of neonicotinoid insecticides. It is considered an agonist of the nicotinic acetylcholine receptor and exhibits excitatory responses including tremors, followed by paralysis and mortality in target insects. Sulfoxaflor consists of two diastereomers in a ratio of approximately 50:50 with each diastereomer consisting of two enantiomers. Sulfoxaflor is systemically distributed in plants when applied. The chemical acts through both contact action and ingestion and provides both rapid knockdown (symptoms are typically observed within 1-2 hours of application) and residual control (generally provides from 7 to 21 days of residual control). Incident reports submitted to EPA since approximately 1994 have been tracked via the Incident Data System. Over the 2012 growing season, a Section 18 emergency use was granted for application of sulfoxaflor to cotton in four states (MS, LA, AR, TN). No incident reports have been received in association with the use of sulfoxaflor in this situation.

Sulfoxaflor is classified as practically non-toxic on an acute exposure basis, with 96-h LC_{50} values of >400 mg a.i./L for all three freshwater fish species tested (bluegill, rainbow trout, and common carp). Mortality was 5% or less at the highest test treatments in each of these studies. Treatment-related sublethal effects included discoloration at the highest treatment concentration (100% of fish at 400 mg a.i./L for bluegill) and fish swimming on the bottom (1 fish at 400 mg a.i./L for rainbow trout). No other treatment-related sublethal effects were reported. For an estuarine/marine sheepshead minnow, sulfoxaflor was also practically non-toxic with an LC_{50} of 288 mg a.i./L. Sublethal effects included loss of equilibrium or lying on the bottom of aquaria at 200 and 400 mg a.i./L. The primary degradate of sulfoxaflor is also classified as practically non-toxic to rainbow trout on an acute exposure basis (96-h LC_{50} >500 mg a.i./L).

Adverse effects from chronic exposure to sulfoxaflor were examined with two fish species (fathead minnow and sheepshead minnow) during early life stage toxicity tests. For fathead minnow, the 30-d NOAEC is 5 mg a.i./L based on a 30% reduction in mean fish weight relative to controls at the next highest concentration (LOAEC=10 mg a.i./L). No statistically significant and/or treatment-related effects were reported for hatching success, fry survival and length. For sheepshead minnow, the 30-d NOAEC is 1.3 mg a.i./L based on a statistically significant reduction in mean length (3% relative to controls) at 2.5 mg a.i./L. No statistically significant and/or treatment-related effects were reported for hatching success, fry survival and mean weight.

The acute toxicity of sulfoxaflor was evaluated for one freshwater invertebrate species, the water flea and two saltwater species (mysid shrimp and Eastern oyster). For the water flea, the 48-h EC_{50} is >400 mg a.i./L, the highest concentration tested. For Eastern oyster, new shell growth was significantly reduced at 120 mg a.i./L (75% reduction relative to control). The 96-h EC_{50} for shell growth is 93 mg a.i./L. No mortality occurred at any test concentration. Mysid shrimp are the most acutely sensitive invertebrate species tested with sulfoxaflor based on water column only exposures, with a 96-h LC_{50} of 0.67 mg a.i./L. The primary degradate of sulfoxaflor is also classified as practically non-toxic to the water flea (EC_{50} >240 mg a.i./L).

The chronic effects of sulfoxaflor to the water flea were determined in a semi-static system over a period of 21 days to nominal concentrations of 6.25, 12.5, 25, 50 and 100 mg a.i./L. Adult mortality, reproduction rate (number of young), length of the surviving adults, and days to first brood were used to determine the toxicity endpoints. No treatment-related effects on adult mortality or adult length were observed. The reproduction rate and days to first brood were significantly ($p<0.05$) different in the 100 mg a.i./L test group (40% reduction in mean number of offspring; 35% increase in time to first brood). No significant effects were observed on survival, growth or reproduction at the lower test concentrations. The 21-day NOAEC and LOAEC were determined to be 50 and 100 mg a.i./L, respectively.

The chronic effects of sulfoxaflor to mysid shrimp were determined in a flow-through system over a period of 28 days to nominal concentrations of 0.063, 0.13, 0.25, 0.50 and 1.0 mg a.i./L. Mortality of parent (F_0) and first generation (F_1), reproduction rate of F_0 (number of young), length of the surviving F_0 and F_1, and days to first brood by F_0 were used to determine the toxicity endpoints. Complete F_0 mortality (100%) was observed at the highest test concentration of 1.0 mg a.i./L within 7 days; no treatment-related effects on F_0/F_1 mortality, F_0 reproduction rate, or F_0/F_1 length were observed at the lower test concentrations. The 28-day NOAEC and LOAEC were determined to be 0.11 mg and 0.25 mg a.i./L, respectively.

Sulfoxaflor exhibited relatively low toxicity to aquatic non-vascular plants. The most sensitive aquatic nonvascular plant is the freshwater diatom with a 96-h EC_{50} of 81.2 mg a.i./L. Similarly, sulfoxaflor was not toxic to the freshwater vascular aquatic plant, *Lemna gibba*, up to the limit amount, as indicated by a 7-d EC_{50} for frond count, dry weight and growth rate of >100 mg a.i./L with no significant adverse effects on these endpoints observed at any treatment concentration.

Based on an acute oral LD_{50} of 676 mg a.i./kg bw for bobwhite quail, sulfoxaflor is considered slightly toxic to birds on an acute oral exposure basis. On a subacute, dietary exposure basis, sulfoxaflor is classified as practically nontoxic to birds, with 5-d LC_{50} values of >5620 mg/kg-diet for mallard ducks and bobwhite quail. The NOAEL from these studies is 5620 mg/kg-diet as no treatment related mortality of sublethal effects were observed at any treatment. Similarly, the primary degradate is classified as practically nontoxic to birds on an acute oral exposure basis with a LD_{50} of >2250 mg a.i./kg bw. In two chronic, avian reproductive toxicity studies, the 20-week NOAELs ranged from 200 mg/kg-diet (mallard, highest concentration tested) to 1000 mg/kg-diet (bobwhite quail, highest concentration tested). No treatment-related adverse effects were observed at any test treatment in these studies.

For bees, sulfoxaflor is classified as very highly toxic with acute oral and contact LD_{50} values of 0.05 and 0.13 μg a.i./bee, respectively, for adult honey bees. For larvae, a 7-d oral LD_{50} of >0.2 μg a.i./bee was determined (45% mortality occurred at the highest treatment of 0.2 μg a.i./bee). The primary metabolite of sulfoxaflor is practically non-toxic to the honey bee. This lack of toxicity is consistent with the cyano-substituted neonicotinoids where similar cleavage of the cyanide group appears to eliminate their insecticidal activity. The acute oral toxicity of sulfoxaflor to adult bumble bees (*Bombus terrestris*) is similar to the honey bee; whereas its acute contact toxicity is about 20X less toxic for the bumble bee. Sulfoxaflor did not demonstrate substantial residual toxicity to honey bees exposed via treated and aged alfalfa (i.e., mortality was <15% at maximum application rates).

At the application rates used (3-67% of US maximum), the direct effects of sulfoxaflor on adult forager bee mortality, flight activity and the occurrence of behavioral abnormalities is relatively short-lived, lasting 3 days or less. Direct effects are considered those that result directly from interception of spray droplets or dermal contact with foliar residues. The direct effect of sulfoxaflor on these measures at the maximum application rate in the US is presently not known. When compared to control hives, the effect of sulfoxaflor on honey bee colony strength when applied at 3-32% of the US maximum proposed rate was not apparent in most cases. When compared to hives prior to pesticide application, sulfoxaflor applied to cotton foliage up to the maximum rate proposed in the US resulted in no discernible decline in mean colony strength by 17 days after the first application. Longer-term results were not available from this study nor were concurrent controls included. For managed bees, the primary exposure routes of concern include direct contact with spray droplets, dermal contact with foliar residues, and ingestion through consumption of contaminated pollen, nectar and associated processed food provisions. Exposure of hive bees via contaminated wax is also possible. Exposure of bees through contaminated drinking water is not expected to be nearly as important as exposure through direct contact or pollen and nectar.

In summary, sulfoxaflor is slightly toxic to practically non-toxic to fish and freshwater water aquatic invertebrates on an acute exposure basis. It is also practically non-toxic to aquatic plants (vascular and non-vascular). Sulfoxaflor is highly toxic to saltwater invertebrates on an acute exposure basis. The high toxicity of sulfoxaflor to mysid shrimp and benthic aquatic insects relative to the water flea is consistent with the toxicity profile of other insecticides with similar MOAs. For birds and mammals, sulfoxaflor is classified as moderately toxic to practically non-toxic on an acute exposure basis. The threshold for chronic toxicity (NOAEL) to birds is 200 ppm and that for mammals is 100 ppm in the diet. Sulfoxaflor did not exhibit deleterious effects to terrestrial plants at or above its proposed maximum application rates.

For bees, sulfoxaflor is classified as very highly toxic. However, if this insecticide is strictly used as directed on the Section 18 supplemental label, no significant adverse effects are expected to Louisiana wildlife. Of course, standard precautions to avoid drift and runoff to waterways of the state are warranted. As stated on the Section 3 label, risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7 am or after 7 pm or when the temperature is below 55°F at the site of application.

Environmental Fate

Sulfoxaflor is a systemic insecticide which displays translaminar movement when applied to foliage. Movement of sulfoxaflor within the plant follows the direction of water transport within the plant (i.e., xylem mobile) as indicated by phosphor translocation studies in several plants. Sulfoxaflor is characterized by a water solubility ranging from 550 to 1,380 ppm. Sulfoxaflor has a low potential for volatilization from dry and wet surfaces (vapor pressure= 1.9 x 10^{-8} torr and Henry's Law constant= 1.2 x 10^{-11} atm m^3 $mole^{-1}$, respectively at 25 °C). Partitioning coefficient of sulfoxaflor from octanol to water (K_{ow} @ 20 C & pH 7= 6; Log K_{ow} = 0.802) suggests low potential for bioaccumulation. No fish bioconcentration study was provided due to the low K_{ow}, but sulfoxaflor is not expected to bioaccumulate in aquatic systems. Furthermore, sulfoxaflor is not expected to partition into the sediment due to low K_{oc} (7-74 mL/g).

Registrants tests indicate that hydrolysis, and both aqueous and soil photolysis are not expected to be important in sulfoxaflor dissipation in the natural environment. In a hydrolysis study, the parent was shown to be stable in acidic/neutral/alkaline sterilized aqueous buffered solutions (pH values of 5, 7 and 9). In addition, parent chemical as well as its major degradate, were shown to degrade relatively slowly by aqueous photolysis in sterile and natural pond water ($t^{½}$= 261 to >1,000 days). Furthermore, sulfoxaflor was stable to photolysis on soil surfaces. Sulfoxaflor is expected to biodegrade rapidly in aerobic soil (half-lives <1 day). Under aerobic aquatic conditions, biodegradation proceeded at a more moderate rate with half-lives ranging from 37 to 88 days. Under anaerobic soil conditions, the parent compound was metabolized with half-lives of 113 to 120 days while under anaerobic aquatic conditions the chemical was more persistent with half-lives of 103 to 382 days. In contrast to its short-lived parent, the major degradate is expected to be more persistent than its parent in aerobic/anaerobic aquatic systems and some aerobic soils. In other soils, less persistence is expected due to mineralization to CO_2 or the formation of other minor degradates.

In field studies, sulfoxaflor has shown similar vulnerability to aerobic bio-degradation in nine out of ten terrestrial field dissipation studies on bare-ground/cropped plots (half-lives were <2 days in nine cropped/bare soils in CA, FL, ND, ON and TX and was 8 days in one bare ground soil in TX). The chemical can be characterized by very high to high mobility (Kf_{oc} ranged from 11-72 mL g^{-1}). Rapid soil degradation is expected to limit chemical amounts that may potentially leach and contaminate ground water. Contamination of groundwater by sulfoxaflor will only be expected when excessive rain occurs within a short period (few days) of multiple applications in vulnerable sandy soils. Contamination of surface water by sulfoxaflor is expected to be mainly related to drift and very little due to run-off. This is because drifted sulfoxaflor that reaches aquatic systems is expected to persist while that reaching the soil system is expected to degrade quickly with slight chance for it to run-off.

When sulfoxaflor is applied foliarly on growing crops it is intercepted by the crop canopy. Data presented above appear to indicate that sulfoxaflor enters the plant and is incorporated in the plant foliage with only limited degradation. It appears that this is the main source of the insecticide sulfoxaflor that would kill sap sucking insects. This is because washed-off sulfoxaflor, that reaches the soil system, is expected to degrade.

In summary, sulfoxaflor has a low potential for volatilization from dry and wet surfaces. This chemical is characterized by a relatively higher water solubility. Partitioning coefficient of sulfoxaflor from octanol to water suggests low potential for bioaccumulation in aquatic organisms such as fish. Sulfoxaflor is resistant to hydrolysis and photolysis but transforms quickly in soils. In contrast, sulfoxaflor reaching aquatic systems by drift is expected to degrade rather slowly. Partitioning of sulfoxaflor to air is not expected to be important due to the low vapor pressure and Henry's Law constant for sulfoxaflor. Exposure in surface water results from the drifted parent compound, and only minor amounts are expected to run-off only when rainfall and/or irrigation immediately follow application. The use of this insecticide is not expected to adversely impact Louisiana ecosystems when used according to the Section 18 label. Of course, caution is needed to prevent exposure to water systems because of toxicity issues to aquatic invertebrates. As stated on the Section 3 label, this product should never be applied directly to water, to areas where surface water is present or to intertidal areas below the mean water mark. Also, the label includes the statement "Do not contaminate water when disposing of equipment rinsate."

Endangered and Threatened Species in Mississippi

No impacts are expected on endangered and threatened species by this very limited use of this insecticide as delineated in the Section 18 application. Sulfoxaflor demonstrates a very favorable ecotoxicity and fate profile as stated above and should not directly impact any protected mammal, fish, avian, or plant species. This product does adversely affect insects and aquatic invertebrates, especially bees, but the limited exposure to these species should not negatively affect endangered and threatened species in Mississippi when all applications label precautions are followed and preformed.

The above content in Section 166.20(a)(7): Discussion of Risk Information was, for the most part, prepared by Michael Hare, Ph.D. (Human Health Effects), David Villarreal, Ph.D.

(Ecological Effects), and David Villarreal, Ph.D. (Environmental Fate), all with the Texas Department of Agriculture. The parts of the above content in this section, with references to Mississippi, were prepared by MDAC-BPI.

SECTION 166.20(a)(8): COORDINATION WITH OTHER AFFECTED STATE OR FEDERAL AGENCIES

The Mississippi Department of Wildlife, Fisheries, and Parks will receive a copy of this request. Any comments received will be forwarded to the U.S. EPA.

SECTION 166.20(a)(9): ACKNOWLEDGEMENT BY THE REGISTRANT

Dow AgroScience has been notified of this agency's intent regarding this application and has offered a letter of support. They have also provided a copy of a label with the use directions for this use (although this use is dependent upon the approval of this section-18 by EPA).

SECTION 166.20(a)(10): DESCRIPTION OF PROPOSED ENFORCEMENT PROGRAM

The Mississippi Department of Agriculture and Commerce (MDAC) has adequate authorities for enforcing provisions of Section 18 emergency exemptions. MDAC will require Dow AgroScience to prepare Section 18 labeling that complies with MDAC and EPA requirements for this emergency use, if approved, to ensure that product distributed for the exemption is properly labeled.

SECTION 166.20(a)(11): REPEAT USES

This is the second time MDAC has applied for this specific exemption.

SECTION 166.20(b)(1): NAME OF THE PEST

Melanaphis sacchari

SECTION 166.20(b)(2): DISCUSSION OF EVENTS OR CIRCUMSTANCES WHICH BROUGHT ABOUT THE EMERGENCY SITUATION

With nearby states suffering from economic loss from sugarcane aphids in sorghum, it is of concern that these infestations will shift to Mississippi. In 2013 the sugarcane aphid was found in a grain sorghum field in Coahoma County and in May 2014 in Washington County on Johnson Grass by Dr. Jeff Gore of Mississippi State University Extension Service. The shift of sugarcane aphids into sorghum is believed to have occurred due to particular weather conditions and cropping schemes. In the 2014 growing season, sugarcane aphid populations could be found in every county in Mississippi where sorghum was planted. Yield losses due to these infestations ranged from 10-100% depending on infestation timing and duration.

- See Attachment A For Additional Yield Loss Data

SECTION 166.20(b)(3): DISCUSSION OF ANTICIPATED RISKS TO ENDANGERED OR THREATENED SPECIES, BENIFICIAL ORGANISMS, OR THE ENVIRONMENT REMEDIED BY THE PROPOSED USE

As previously stated, it is not anticipated that there should be any anticipated risk to endangered or threated species, beneficial organisms, or the environment if all applications are made in accordance to the section 18 use directions.

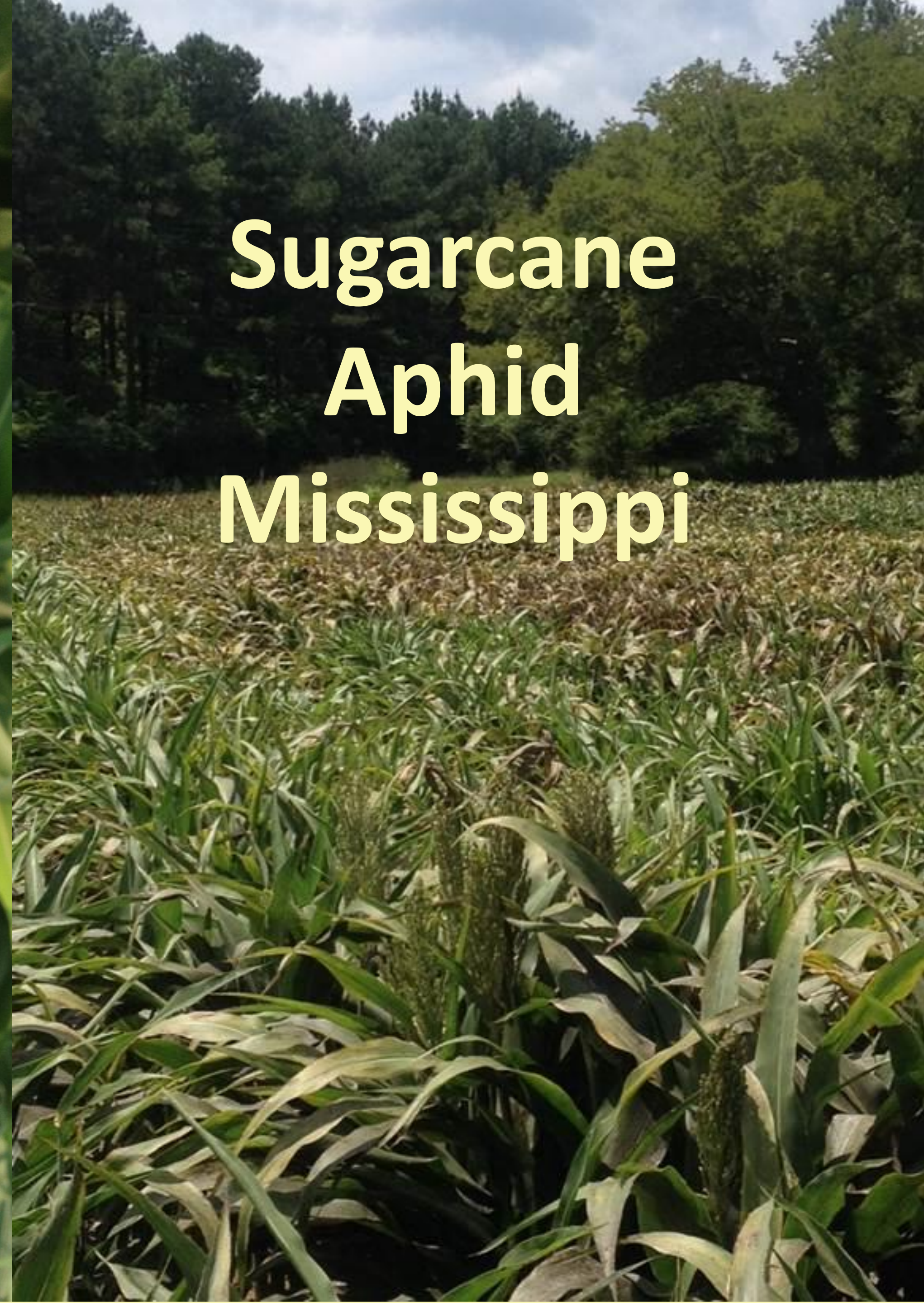
- See Attachment B – Endangered and Threatened Species List 2014

SECTION 166.20(b)(4): DISCUSSION OF SIGNIFICANT ECONOMIC LOSS

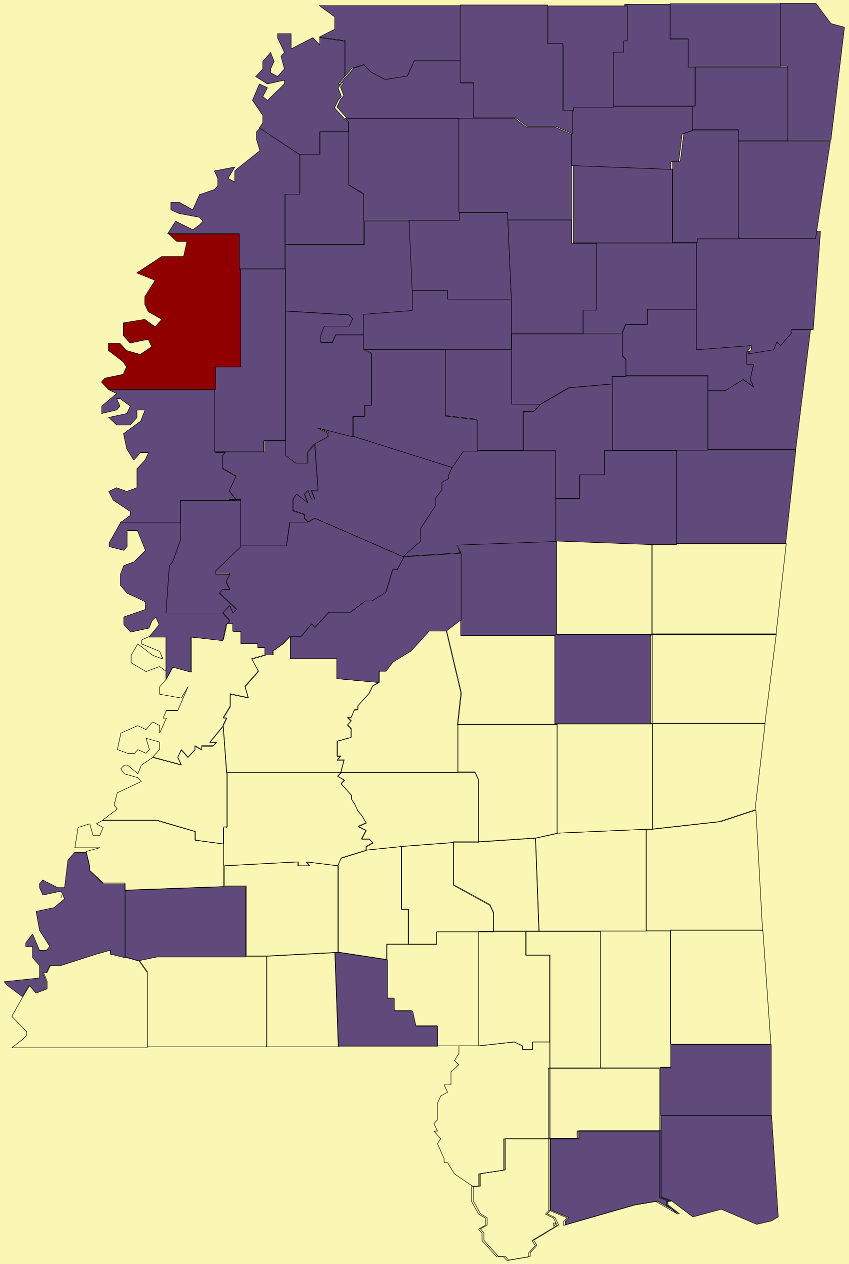
During the 2014 growing season, Mississippi saw experienced a 10-100% yield loss in sorghum fields that had been infested with sugarcane aphids. The sugarcane aphid has been found in every county in Mississippi that planted sorghum in the 2014 growing season. In 2014 trails conducted by Dr. Angus Catchot, it was found that sorghum treated with Transform yielded 104 bushels/acre, whereas sorghum plots that went untreated yielded only 34 bushels/acres. This extreme loss in yield results in a significant yield loss for the State of Mississippi.

Attachment A

Sugarcane Aphid in Mississippi


Sugarcane
Aphid
Mississippi

Sugarcane Aphid Distribution Map

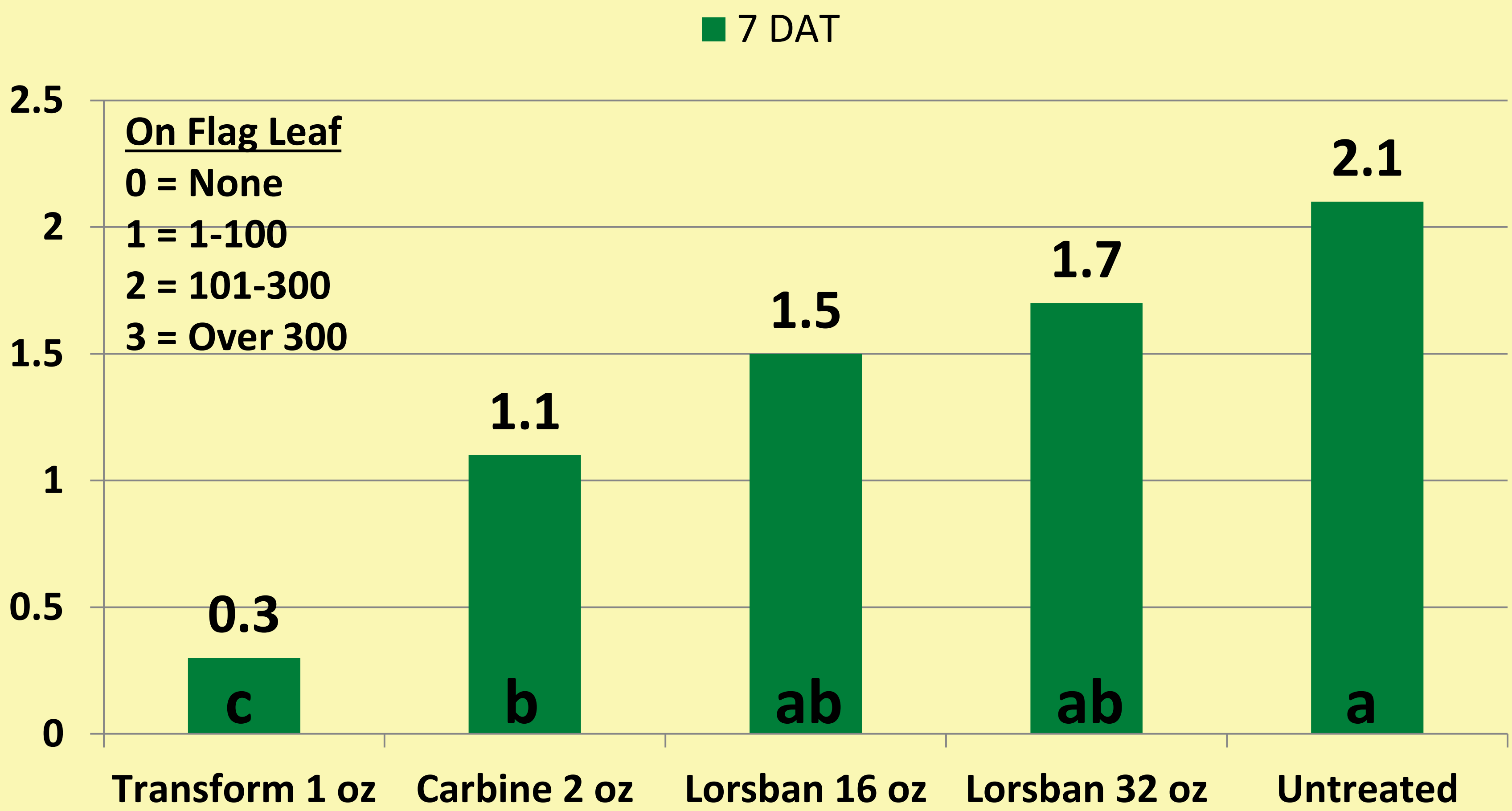


2013 Finds

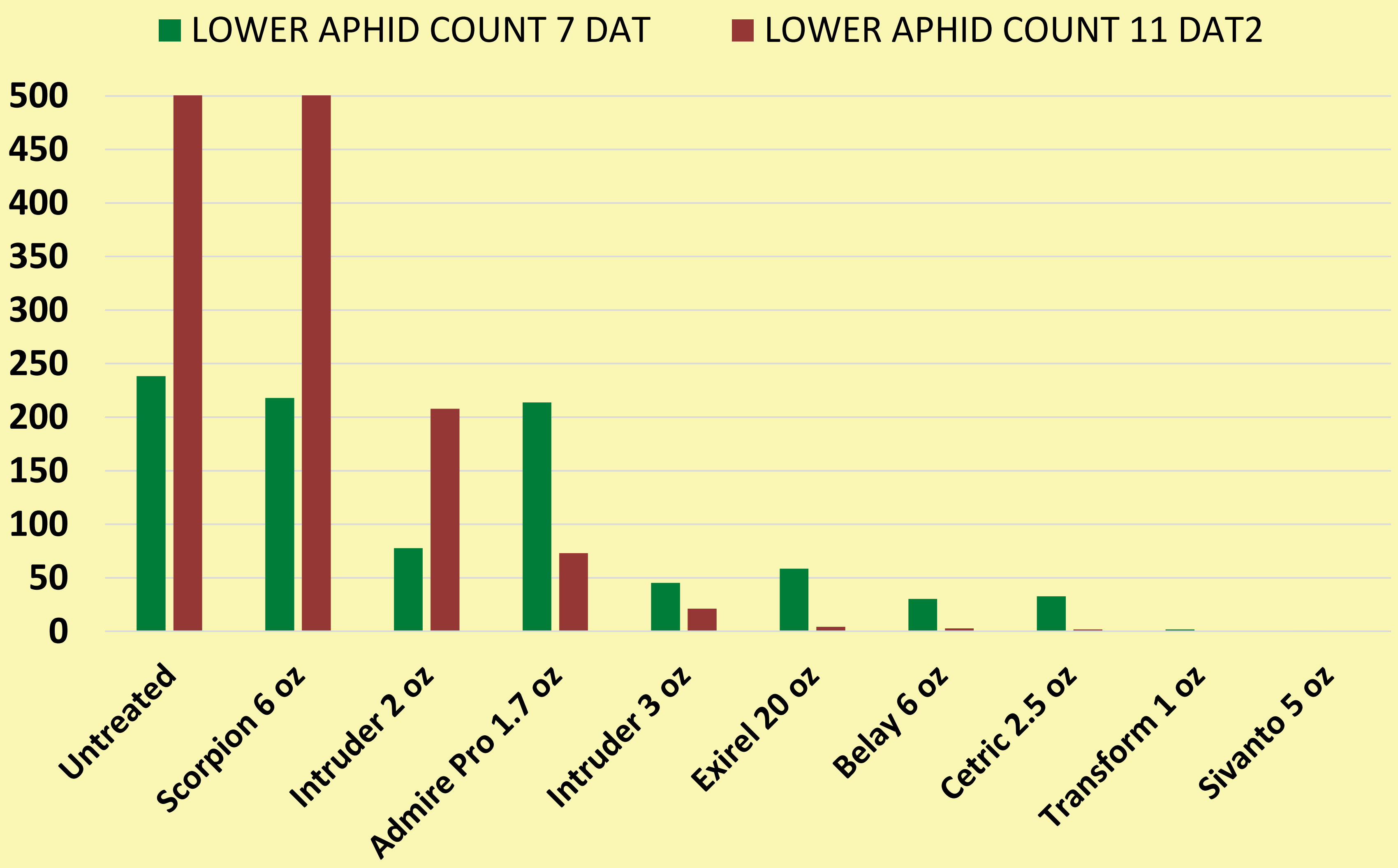
2014 Finds

Insecticide Evaluation

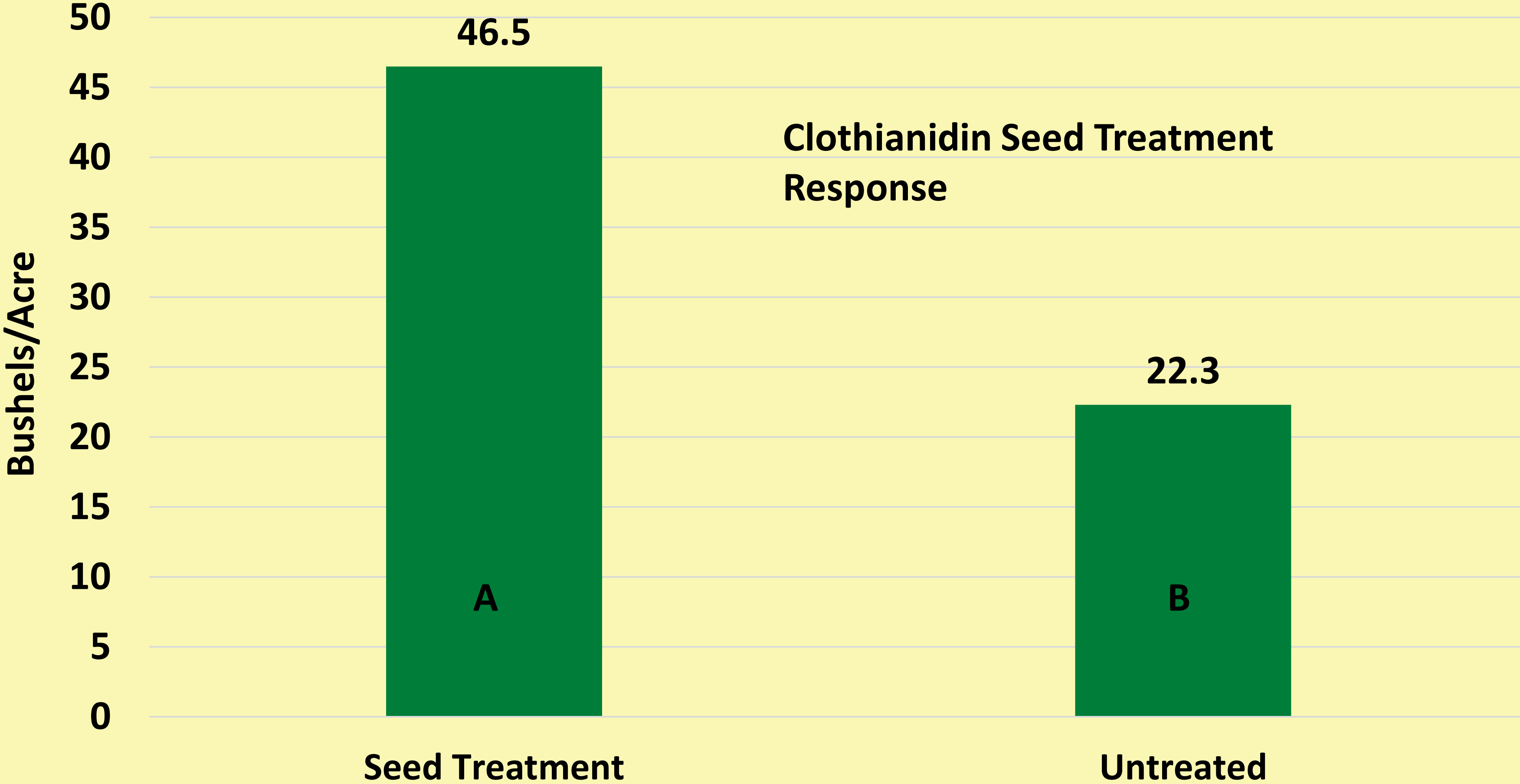
2014 White Sugarcane Aphid Efficacy Average/25 Flag Leaves



2014 Sugarcane Aphid Efficacy Test



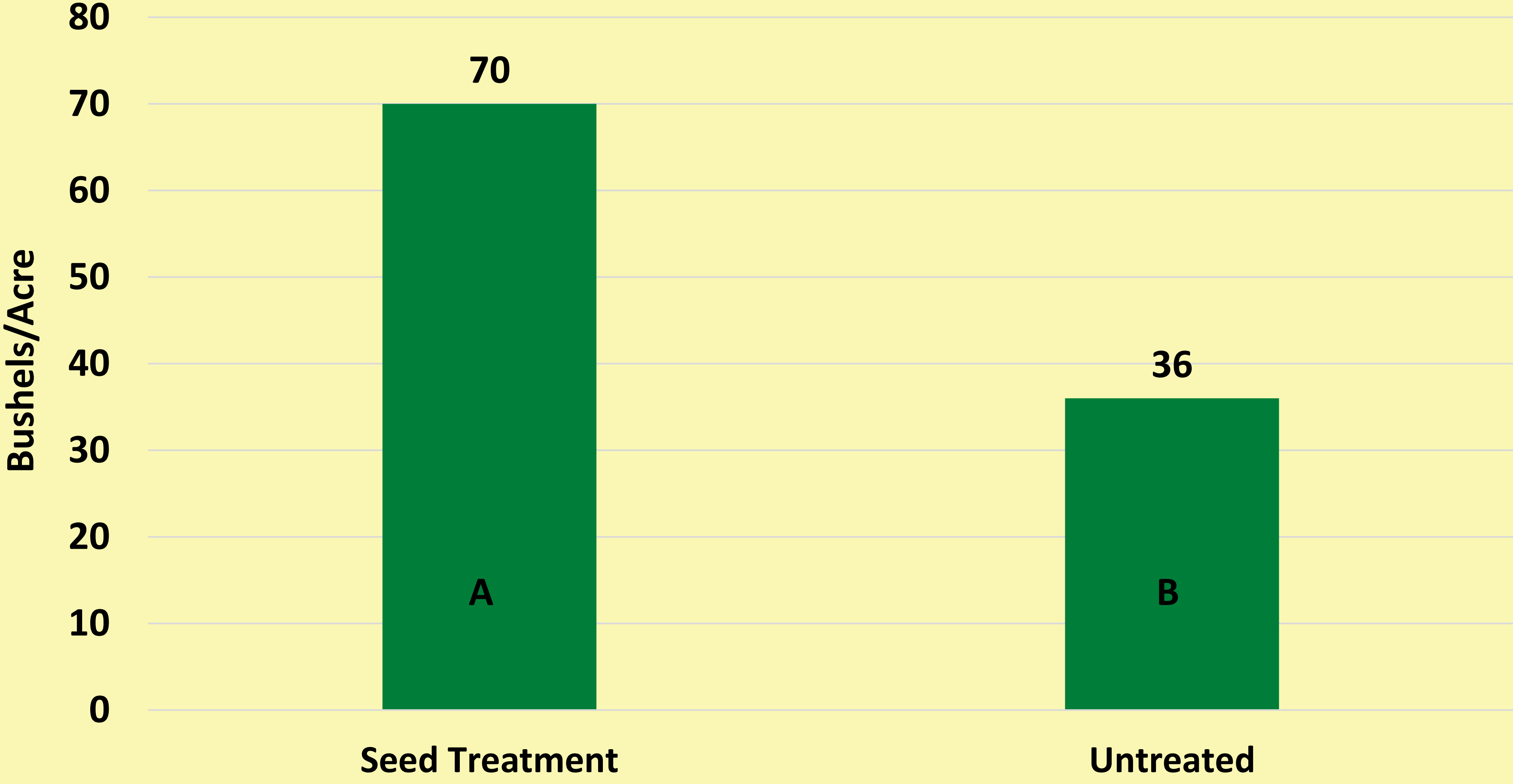
2014 Yield of Grain Sorghum Infested Pre-boot Stage with Sugarcane Aphids Early Planted Delta-No Foliar Treatment



52% Yield Loss with no seed treatment

Yield Loss

2014 Yield of Grain Sorghum Infested Pre-boot Stage with Sugarcane Aphids-Delta

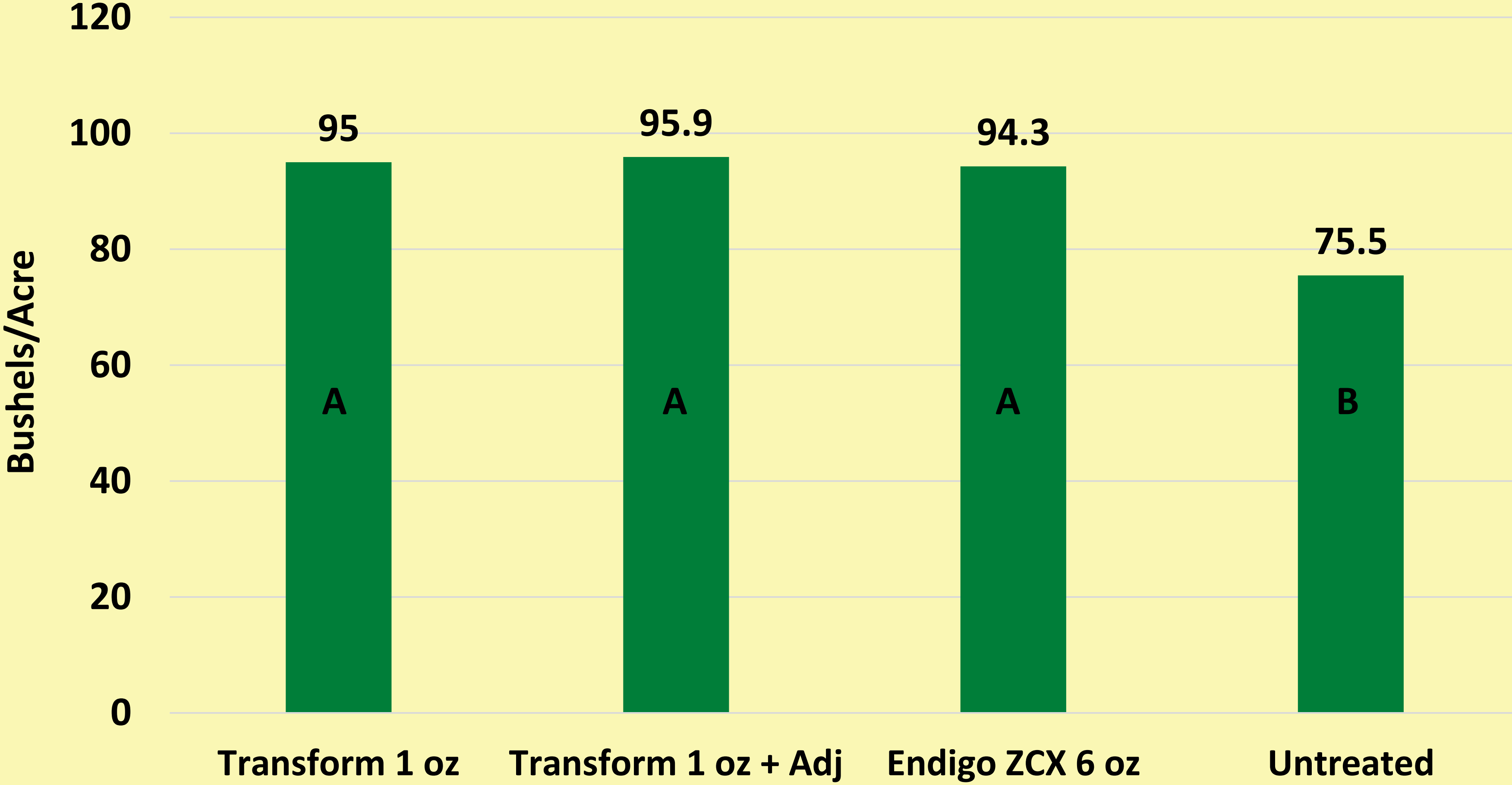


51% Yield Loss with no seed treatment

2014 Yield of Grain Sorghum Infested Panicle Emergence Stage with Sugarcane Aphids- Treated 2X Transform

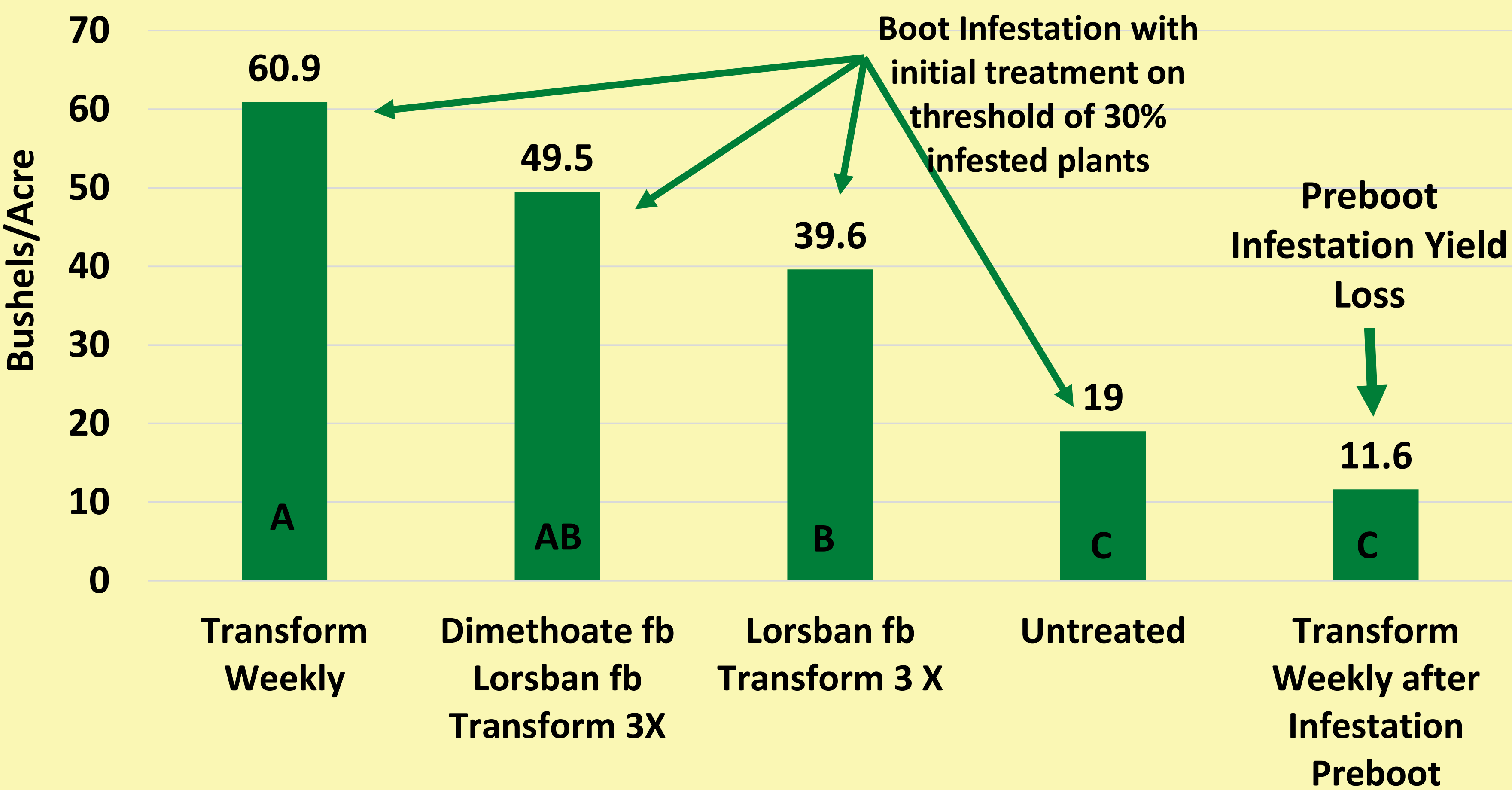
67% Yield Loss with no application

2014 Yield of Grain Sorghum Infested at Soft Dough with Sugarcane Aphids



21% Yield Loss as Late as Soft Dough

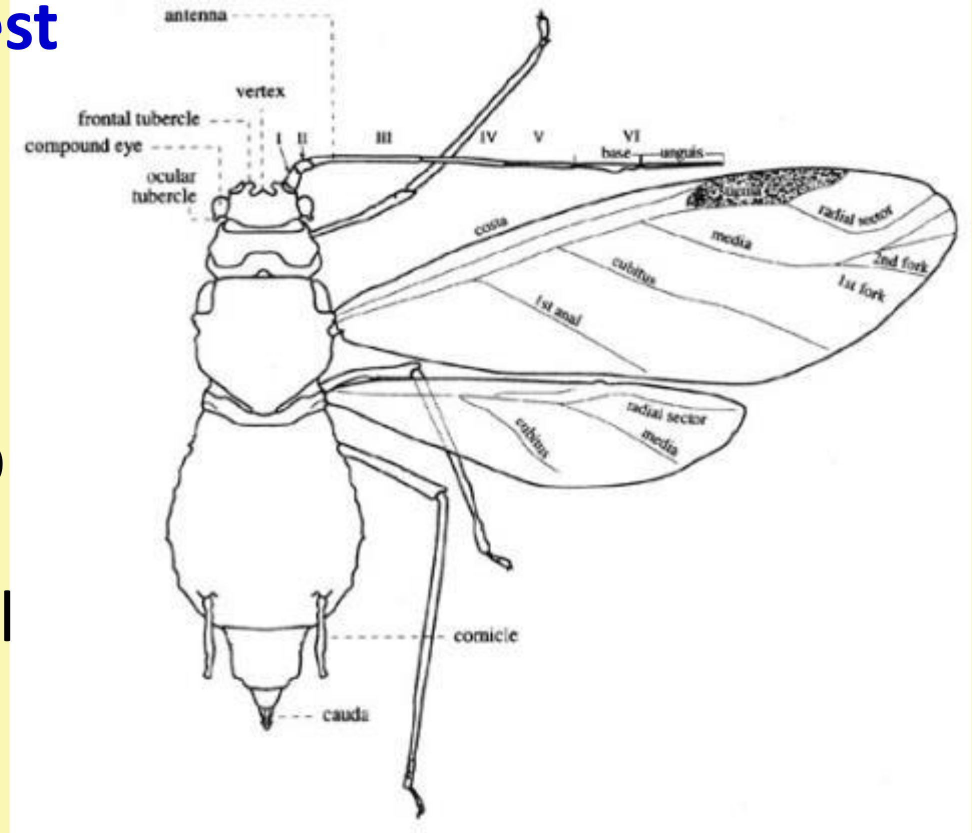
2014 Yield of Grain Sorghum System Trial (Starkville)



Taxonomic Classification

Problems with the ID of the sugarcane aphids

- Taxonomically this **new pest of sorghum** was indistinct to ***Melanaphis sacchari***



- Using molecular tools it matched the taxonomic ID
- However, there are several biotypes in the world
- A **host shift might occurred** (*It wouldn't be the first time for aphids*) or **a new biotype was introduced**

Attachment B

Mississippi Endangered and Threatened Species List 2014

MISSISSIPPI

List of Federally Threatened and Endangered Species by County

Codes: E = Endangered **C = Candidate**
CH = Critical Habitat **N/A = not applicable (no listed species)**
P = Proposed **T = Threatened**

February 2014

The following list contains species that are known to occur in Mississippi. It includes historic range information, known species locations, as well as the "Section 7 range" of a species population which identifies the area within which, if an action is proposed, potential effects to this species should be considered.

NOTE: Brown Pelican (*Pelecanus occidentalis)* was delisted in 2009 but the pelican is still protected by the Migratory Bird Treaty Act. The American Bald Eagle *(Haliaeetus leucocephalus)* was delisted in 2007 but nesting eagles and their nest trees are still protected under the Bald and Golden Eagle Protection Act.

Statewide	T	Wood Stork	*Mycteria americana*

Adams	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
Alcorn	E	Indiana bat	*Myotis sodalis*
	E	Mitchell's satyr butterfly	*Neonympha mitchellii mitchellii*
	PE	Northern long-eared bat	*Myotis septentrionalis*
	T	Price's potato bean	*Apios priceana*
Amite	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*
Attala	T	Louisiana black bear	*Ursus americanus luteolus*
Benton	E	Indiana bat	*Myotis sodalis*
	PE	Northern long-eared bat	*Myotis septentrionalis*
Bolivar	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
Calhoun	N/A		
Carroll	N/A		
Chickasaw	T	Price's potato bean	*Apios priceana*

Choctaw	N/A		
Claiborne	T	Bayou darter	*Etheostoma rubrum*
	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
Clarke	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Clay	T	Price's potato bean	*Apios priceana*
Coahoma	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
Copiah	T	Bayou darter	*Etheostoma rubrum*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Ringed map turtle	*Graptemys oculifera*
Covington	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
DeSoto	E	Fat pocketbook	*Potamilus capax*
	E	Indiana bat	*Myotis sodalis*
	E	Least tern (interior)	*Sterna antillarum*
	PE	Northern long-eared bat	*Myotis septentrionalis*
	E	Pallid sturgeon	*Scaphirhynchus albus*
Forrest	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	ECH	Dusky gopher frog	*Rana sevosa*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Franklin	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*

George	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	E	Red-cockaded woodpecker	*Picoides borealis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Greene	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Grenada	N/A		
Hancock	T	Gopher tortoise	*Gopherus polyphemus*
	T	Green sea turtle	*Chelonia mydas*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Inflated heelsplitter	*Potamilus inflatus*
	E	Kemp's ridley sea turtle	*Lepidochelys kempii*
	E	Leatherback sea turtle	*Dermochelys comacea*
	TCH	Loggerhead sea turtle	*Caretta caretta*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	TCH	Piping Plover	*Charadrius melodus*
	PT	Red Knot	*Calidris canutus rufa*
	T	Ringed map turtle	*Graptemys oculifera*
	E	West Indian manatee	*Trichechus manatus*
Harrison	E	Alabama red-bellied turtle	*Psuedemys alabamensis*
	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	ECH	Dusky gopher frog	*Rana sevosa*
	T	Gopher tortoise	*Gopherus polyphemus*
	T	Green sea turtle	*Chelonia mydas*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	E	Kemp's ridley sea turtle	*Lepidochelys kempii*
	E	Leatherback sea turtle	*Dermochelys comacea*
	TCH	Loggerhead sea turtle	*Caretta caretta*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	TCH	Piping Plover	*Charadrius melodus*
	PTCH	Red Knot	*Calidris canutus rufa*
	E	Red-cockaded woodpecker	*Picoides borealis*
	E	West Indian manatee	*Trichechus manatus*

Hinds	T	Bayou darter	*Etheostoma rubrum*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
	T	Ringed map turtle	*Graptemys oculifera*
Holmes	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pondberry	*Lindera melissifolia*
Humphreys	T	Louisiana black bear	*Ursus americansu luteolus*
	E	Pondberry	*Lindera melissifolia*
	E	Sheepnose mussel	*Plethobasus cyphyus*
Issaquena	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
Itawamba	TCH	Alabama moccasinshell	*Medionidus acutissimus*
	E	Black clubshell	*Pleurobema curtum*
	E	Heavy pigtoe	*Pleurobema taitianum*
	T	Inflated heelsplitter	*Potamilus inflatus*
	E	Mitchell’s satyr butterfly	*Neonympha mitchellii mitchellii*
	TCH	Orange-nacre mucket	*Lampsilis perovalis*
	ECH	Ovate clubshell	*Pleurobema perovatum*
	ECH	Southern clubshell	*Pleurobema decisum*
	E	Southern combshell	*Epioblasma penita*
Jackson	E	Alabama red-bellied turtle	*Psuedemys alabamensis*
	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	ECH	Dusky gopher frog	*Rana sevosa*
	T	Gopher tortoise	*Gopherus polyphemus*
	T	Green sea turtle	*Chelonia mydas*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	E	Kemp's ridley sea turtle	*Lepidochelys kempii*
	E	Leatherback sea turtle	*Dermochelys comacea*
	T	Louisiana black bear	*Ursus americansus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	TCH	Loggerhead sea turtle	*Caretta caretta*
	ECH	Mississippi sandhill crane	*Grus canadensis pulla*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	TCH	Piping Plover	*Charadrius melodus*
	PT	Red Knot	*Calidris canutus rufa*
	E	Red-cockaded woodpecker	*Picoides borealis*
	E	West Indian manatee	*Trichechus manatus*
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Jasper	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*

Jefferson	E	Fat pocketbook mussel	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Red-cockaded woodpecker	*Picoides borealis*
Jefferson Davis	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
Jones	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Kemper	T	Price's potato bean	*Apios priceana*
Lafayette	N/A		
Lamar	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*
Lauderdale	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Louisiana black bear	*Ursus americanus luteolus*
Lawrence	C	Pearl darter	*Percina aurora* (Pearl River System)
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Ringed map turtle	*Graptemys oculifera*
Leake	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	T	Ringed map turtle	*Graptemys oculifera*
Lee	T	Price's potato bean	*Apios priceana*
Leflore	E	Pondberry	*Lindera melissifolia*
Lincoln	T	Bayou darter	*Etheostoma rubrum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*

Lowndes	TCH	Alabama moccasinshell	*Medionidus acutissimus*
	E	Black clubshell	*Pleurobema curtum*
	E	Heavy pigtoe mussel	*Pleurobema taitianum*
	T	Inflated heelsplitter	*Potamilus inflatus*
	TCH	Orange-nacre mucket	*Lampsilis perovalis*
	ECH	Ovate clubshell	*Pleurobema perovatum*
	T	Price's potato bean	*Apios priceana*
	ECH	Southern clubshell	*Pleurobema decisum*
	E	Southern combshell	*Pleurobema penita*
Madison	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
	T	Ringed map turtle	*Graptemys oculifera*
Marion	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	T	Ringed map turtle	*Graptemys oculifera*
Marshall	E	Indiana bat	*Myotis sodalis*
	PE	Northern long-eared bat	*Myotis septentrionalis*
Monroe	TCH	Alabama moccasinshell	*Medionidus acutissimus*
	E	Black clubshell	*Pleurobema curtum*
	E	Heavy pigtoe mussel	*Pleurobema taitianum*
	T	Inflated heelsplitter	*Potamilus inflatus*
	E	Mitchell’s satyr butterfly	*Neonympha mitchellii mitchellii*
	TCH	Orange-nacre mucket	*Lampsilis perovalis*
	ECH	Ovate clubshell	*Pleurobema perovatum*
	T	Price's potato bean	*Apios priceana*
	ECH	Southern clubshell	*Pleurobema decisum*
	E	Southern combshell	*Epioblasma penita*
Montgomery	N/A		
Neshoba	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Ringed map turtle	*Graptemys oculifera*
Newton	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*
Noxubee	TCH	Alabama moccasinshell	*Medionidus acutissimus*
	T	Inflated heelsplitter	*Potamilus inflatus*
	TCH	Orange-nacre mucket	*Lampsilis perovalis*
	T	Price's potato bean	*Apios priceana*
	E	Red-cockaded woodpecker	*Picoides borealis*
	ECH	Southern clubshell	*Pleurobema decisum*
Oktibbeha	T	Price's potato bean	*Apios priceana*
	E	Red-cockaded woodpecker	*Picoides borealis*

Panola	N/A		
Pearl River	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Inflated heelsplitter	*Potamilus inflatus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Ringed map turtle	*Graptemys oculifera*
Perry	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	ECH	Dusky gopher frog	*Rana sevosa*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus mericanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Yellow-blotched map turtle	*Graptemys favimaculata*
Pike	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
Pontotoc	T	Price's potato bean	*Apios priceana*
Prentiss	E	Mitchell’s satyr butterfly	*Neonympha mitchellii mitchellii*
	T	Price's potato bean	*Apios priceana*
Quitman	E	Pondberry	*Lindera melissifolia*
Rankin	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Ringed map turtle	*Graptemys oculifera*
Scott	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Ringed map turtle	*Graptemys oculifera*
Sharkey	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pondberry	*Lindera melissifolia*
	E	Sheepnose mussel	*Plethobasus cyphyus*
Simpson	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	C	Pearl darter	*Percina aurora* (Pearl River System)
	T	Ringed map turtle	*Graptemys oculifera*
Smith	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Red-cockaded woodpecker	*Picoides borealis*

Stone	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	E	Red-cockaded woodpecker	*Picoides borealis*
Sunflower	E	Pondberry	*Lindera melissifolia*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
	E	Sheepnose mussel	*Plethobasus cyphyus*
Tallahatchie	E	Pondberry	*Lindera melissifolia*
Tate	N/A		
Tippah	E	Indiana bat	*Myotis sodalis*
	PE	Northern long-eared bat	*Myotis septentrionalis*
Tishomingo	ECH	Cumberlandian combshell	*Epioblasma brevidens*
	E	Gray bat	*Myotis grisescens*
	E	Indiana bat	*Myotis sodalis*
	E	Mitchell's satyr butterfly	*Neonympha mitchellii mitchellii*
	PE	Northern long-eared bat	*Myotis septentrionalis*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
	ECH	Slabside pearlymussel	*Lexingonia dolabelloides*
	E	Snuffbox	*Epioblasma triquetra*
Tunica	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
Union	T	Price's potato bean	*Apios priceana*
Walthall	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
Warren	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*
Washington	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus mericanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Pondberry	*Lindera melissifolia*
	E	Sheepnose mussel	*Plethobasus cyphyus*

Wayne	C	Black pinesnake	*Pituophis melanoleucus* ssp. *lodingi*
	T	Gopher tortoise	*Gopherus polyphemus*
	TCH	Gulf sturgeon	*Acipenser oxyrinchus desotoi*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Louisiana quillwort	*Isoetes louisianensis*
	C	Pearl darter	*Percina aurora* (Pascagoula River System)
	E	Red-cockaded woodpecker	*Picoides borealis*
	T	Yellow-blotched map turtle	*Graptemys flavimaculata*
Webster	N/A		
Wilkinson	E	Fat pocketbook	*Potamilus capax*
	E	Least tern (interior)	*Sterna antillarum*
	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pallid sturgeon	*Scaphirhynchus albus*
	E	Red-cockaded woodpecker	*Picoides borealis*
Winston	E	Red-cockaded woodpecker	*Picoides borealis*
Yalobusha	N/A		
Yazoo	T	Louisiana black bear	*Ursus americanus luteolus*
	E	Pondberry	*Lindera melissifolia*
	T	Rabbitsfoot mussel	*Quadrula cylindrica cylindrica*

2014 Mississippi Sorghum Acres

USDA United States Department of Agriculture
National Agricultural Statistics Service

research survey data census research survey

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Data and Statistics

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Acreage, Yield and Production - Irrigated / Non-Irrigated for SORGHUM

YEAR	LOCATION	REFERENCE PERIOD	COMMODITY	PRODN PRACTICE	AREA HARVESTED in ACRES	PRODUCTION in BU	YIELD in BU / ACRE	AREA PLANTED in ACRES
2014	MISSISSIPPI	YEAR	SORGHUM	ALL PRODUCTION PRACTICES	...	...	...	115,000
2014	MISSISSIPPI	YEAR	SORGHUM, GRAIN	ALL PRODUCTION PRACTICES	110,000	9,900,000	90	...

Please click here to provide feedback

Mississippi State University

Department of Entomology and Plant Pathology

November 24, 2014

To whom it may concern:

In July of 2013 the state of Louisiana discovered a new species of aphid in grain sorghum not previously noted in the mid-southern region to be a pest of grain sorghum. On further examination it was found to be sugarcane aphid, *Melanaphis sacchari*.

In 2014 Mississippi producers planted nearly 100K acres of grain sorghum. Although only one county (Bolivar) reported sugarcane aphids in 2013, every county with grain sorghum planted encountered sugarcane aphids in 2014 at some level. Entomologist in MS conducted several trials in 2014 to determine potential yield loss from this invasive pest. Yield losses ranged from 10-100% depending on infestation timing and duration. The Mississippi State University Extension Service witnessed numerous producer fields that suffered severe economic loss. There are currently no labeled alternatives for control of this pest.

Sugarcane aphids are now in 11 states since first discovered late in the 2013 growing season. The capacity of this pest to spread through the landscape and infest new areas is astonishing. We fully anticipate having to deal with this pest in 2015. The emergency exemption granted in 2014 in the state of Mississippi prevented catastrophic levels of loss by grain sorghum producers.

Currently the academic community is extremely worried about the development of resistance to Transform insecticide since it is the only viable option for control of this pest. Sorghum breeders are currently working on resistant lines and we are evaluating cultural practices such as planting date and plant populations. At this time there are currently no proven management options other than incorporating multiple modes of action of insecticide until host plant resistance is worked into commercial varieties and cultural methods are tested.

We are requesting the use of Transform WG Insecticide EPA Reg. No. 62719-625 for the 2015 season in the state of Mississippi under Section 18 emergency exemption to prevent severe loss from sugarcane aphids. Supporting documentation is attached.

Thank you.

Sincerely,

Angus Catchot

Angus Catchot, Extension Entomologist-MSU-ES

Cooperative Extension Service • Mississippi State University
Extension Entomologists: Box 9775 • Mississippi State, MS 39762-9775 • Phone (662) 325-2085 • Fax (662) 325-8837
Extension Plant Pathologists: Box 9655 • Mississippi State, MS 39762-9665 • Phone (662) 325-2146 • Fax (662) 325-8336

Dow AgroSciences

www.dowagro.com

December 3, 2014

John Campbell, Bureau Director
Mississippi Department of Agriculture
Bureau of Plant Industry
P. O. Box 5207
Mississippi State, MS 39762

Re: Support letter for Transform™ WG Section 18 on sorghum

Dear Mr. Campbell,

Per your request, this letter is to confirm that Dow AgroSciences supports the pursuit of a Section 18 emergency exemption for Transform WG to control sugarcane aphid in sorghum in the state of Mississippi. Transform WG was registered by the US Environmental Protection Agency to control aphids and other pests on a number of crops in 2013.

Transform WG provides excellent efficacy against aphids and the active ingredient, sulfoxaflor, represents a new class of chemistry with a novel mode of action. As such it controls pests resistant to other classes of chemistry, among other benefits.

If you have questions, please do not hesitate to call me.

Sincerely,

Jamey Thomas, Ph.D.
US Regulatory Manager
Dow AgroSciences

cc: Tami Jones-Jefferson, DAS

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Dow AgroSciences

Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268-1054 USA

Transform® WG

EPA Reg. No. 62719-625

For Control of Sugarcane Aphid (*Melanaphis sacchari*) in Sorghum
Section 18 Emergency Exemption

File symbol: XXXXXX

FOR DISTRIBUTION AND USE ONLY IN MISSISSIPPI UNDER SECTION 18 EMERGENCY EXEMPTION

This Section 18 Emergency Exemption is effective XXXXX and expires XXXXXXX.

- This labeling must be in the possession of the user at the time of application.
- It is in violation of federal law to use this product in a manner inconsistent with its labeling.
- All application directions, restrictions, and precautions on the registered product label for Transform WG (EPA Reg. No. 62719-625) are to be followed.
- Any adverse effects resulting from the use of Transform WG under this emergency exemption must be immediately reported to the Mississippi Department of Agriculture.

Directions for Use

Pests and Application Rates:

Pests	Transform WG (oz/acre)	Comments
Sugarcane aphid	0.75 – 1.5 (0.023 – 0.047 lb ai/acre)	Use a higher rate in the rate range for heavy pest populations.

Application Timing: Treat in accordance with local economic thresholds. Consult your Dow AgroSciences representative, cooperative extension service, certified crop advisor or state agricultural experiment station for any additional local use recommendations for your area.

Application Method: Control of sugarcane aphid may be contingent on thorough coverage to the crop. Use sufficient water to get full coverage of the canopy. It is recommended that a minimum of 5 gallons of water be applied by air.

Restrictions:
- **Preharvest Interval:** Do not apply within 14 days of grain or straw harvest or within 7 days of grazing, or forage, fodder, or hay harvest.
- A restricted entry interval (REI) of 24 hours must be observed.
- Do not make more than three applications per acre per year.
- Do not make more than two consecutive applications per crop.
- **Minimum Treatment Interval:** Do not make applications less than 14 days apart.
- Do not apply more than a total of 3.0 oz of Transform WG (0.09 lb ai of sulfoxaflor) per acre per year.

Environmental Hazards

This product is highly toxic to bees exposed through contact during spraying and while spray droplets are still wet. This product may be toxic to bees exposed to treated foliage for up to 3 hours following application. Toxicity is reduced when spray droplets are dry.

Risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when the temperature is below 55 degrees F at the site of application.

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

R396-036
Approved: __/__/__
Replaces R396-020